

PCT 10/510060

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 62431A	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/US 03/15148	International filing date (day/month/year) 14.05.2003	Priority date (day/month/year) 15.05.2002
International Patent Classification (IPC) or both national classification and IPC G01N30/00		
Applicant DOW GLOBAL TECHNOLOGIES INC. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 19.11.2003	Date of completion of this report 15.07.2004
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**INTERNATIONAL PRELIMINARY
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International application No. **PCT/US 03/15148**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*):

Description, Pages

1-14 as originally filed

Claims, Numbers

1-12 as originally filed

Drawings, Sheets

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	10
	No: Claims	1-9,11,12
Inventive step (IS)	Yes: Claims	
	No: Claims	1-12
Industrial applicability (IA)	Yes: Claims	1-12
	No: Claims	

2. Citations and explanations

see separate sheet

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International application No. PCT/US03/15148

Reference is made to the following documents:

- D1: WO 99 42489 A (GORENSTEIN MARC V ;BRUN YEFIM (US); WATERS INVESTMENTS LTD (US)) 26 August 1999 (1999-08-26)
D2: US-B1-6 294 388 (PETRO MIROSLAV) 25 September 2001 (2001-09-25)
D3: US-A-4 775 943 (CHAMBERLIN THOMAS A ET AL) 4 October 1988 (1988-10-04)

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

The application is related to a method for the analysis of long chained branched macromolecules.

Clarity (Article 6 PCT):

Claims 1,4,5, and 10 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined.

Portion (a) of claim 1 and claims 3 and 4 attempts to define the subject-matter in terms of the desired result to be achieved which merely amounts to a statement of the underlying problem. The technical features necessary for achieving the result of eluting linear macromolecules are not defined in the claims. The vague statement of sufficiently small channels and a certain linear velocity range to obtain a desired separation cannot be regarded as a definition which complies with Article 6 PCT, because any separation process comprising stationary and mobile phase will have a certain channel width and velocity range.

Furthermore, claim 1 merely relates to a separation of macromolecules and does not define how to employ the characterization or analysis of the sample.

Claim 10 is not clear because it does not define the method steps necessary to perform scanning probe microscopy on an eluting sample.

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Novelty (Article 33(2) PCT):

Taking into account the clarity objections stated above, the remaining method steps of independent method claim 1 are rather broad and general, that is

(a) providing a flow through separating medium (100) and a liquid eluent (101) in which the macromolecules dissolve, the separating medium defining a multiplicity of flow through channels (102), and wherein the separation is conducted under temperature conditions

(b) introducing a sample

(c) flowing the liquid eluent under pressure through the channels at a desired velocity

(d) differentiating linear macromolecules from long chain branched macromolecules.

These steps are so general that they are not new over D1, which discloses a gel permeation chromatography (GPC) system and the corresponding method to reveal the branching properties of a polymer, see D1, page 8, lines 11-19.

D1 further discloses the determination of the topology of a polymer through concentration detection, page 2, lines 8-12. Therefore the subject-matter of claims 2 and 6 is not new.

The technique of size exclusion chromatography separations is disclosed on page 5, line 13-15. Therefore the subject-matter of claim 5 is not new.

The detection methods according to claims 6 - 9 are also known or hinted from D1.

Claim 10 is not inventive, because it is related to the juxtaposition of two known methods, without inventive interrelationship.

In view of the objections stated above, product claims 11 and 12 cannot be regarded as novel or inventive.

Applicants argument, that D1, D2, and D3 are considered of interest only as background art is not convincing. Contrary to applicants statement, that claim 1 relates to flow of polymer through the channels of the separating medium, in contrast to the

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diffusion into and out of the channels of the separating medium of the gel permeation chromatography system, D1 clearly states injection of the sample 14 into the flowing stream through the column set 16. The separation is effected by a sieving mechanism. The pores exclude the larger molecules and retain the smaller molecules. Larger molecules see a column set having a relatively small effective volume. Smaller molecules see a column set having a relatively large effective volume. Consequently, the larger molecules elute first, and the smaller molecules elute later. The detectors 18 follow the column set 16 and measure the physical properties of the eluent, see page 8, line 20 - 30. Furthermore, D1 is silent on diffusion.